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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,890	04/13/2004	Edgar B. Dally	TIP/TEL 201	4012

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STANLEY Z COLE
26620 ST FRANCIS ROAD
LOS ALTOS HILLS, CA 94022

EXAMINER	
ROY, SIKHA	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/822,890	DALLY ET AL.	
	Examiner	Art Unit	
	Sikha Roy	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, 'the cathode mounted off center within the shell' as claimed in claim 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 18 and 19 are objected to because of the following informalities:

Claims 18 and 19 recite the limitation "the unit" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4,6,7,10,15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,407,492 to Avnery et al.

Regarding claim 1 Avnery discloses (Fig. 11 column 7 lines 51-66) an electron generator 70 comprising a cylindrical shell 72 for containing a vacuum, a series of openings in the shell extending around the shell, windows 82 comprising a thin material positioned and covering the openings and adapted to make the shell vacuum tight, electron emitting surface (filament) 78 positioned within the shell 72 generating energetic electrons along its length, focusing elements (column 4 lines 60-67) 35 to direct the generated electrons to travel to the windows so that a substantial number of generated electrons strike and pass through the windows.

Regarding claim 2 Avnery discloses in Fig. 11 the electron emitting surface 78 is axially continuous through substantially the length of the shell 72.

Regarding claim 3 Avnery discloses the electron generator 70 includes a grid 35 (in filament housing) between the electron emitting surface 78 and the shell to focus the electrons towards the opening in the shell.

Regarding claims 4 and 7 Avnery discloses (column 4 lines 8,9) the window membrane comprises metal foil made of titanium.

Regarding claim 6 Avnery discloses (column 4 lines 25-32, Fig. 2) the shell is liquid cooled.

Regarding claim 10 Avnery discloses (column 5 lines 19-23) the electron emitting surface is a hot wire filament.

Referring to claim 15 Avnery discloses (column 4 lines 8-15) the exit windows are In the range of 6 to 12 microns thick which is in the claimed range of 0.0003" to several thousandths of an inch thick.

Regarding claim 16 Avnery discloses (column 6 lines 56-60) controlled vacuum is maintained within the chamber continuously.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al.

Regarding claim 21 Avnery discloses the claimed invention except for the cathode mounted off center within the shell. It would have been obvious matter of design choice to mount the cathode off center within the shell since the applicant has not disclosed that such design of the cathode solves any stated problem or is for any particular reason and it appears that the invention would perform equally well with the cathode mounted at the center within the shell as disclosed by Avnery.

Regarding claim 23 Avnery discloses (column 1 lines 7-10) the electron beams of the electron source is used for clean-up hazardous waste. Therefore it would have been obvious to one of ordinary skill in the art a the time of invention to include the electron generator positioned in a housing and emitting energetic electrons circumferentially inside a gas cleanup system through which gas to be treated is flowing.

Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al. and further in view of U.S. Patent 4,359,666 to Tornoe.

Regarding claim 5 Avnery is silent about the openings extending circumferentially around the shell.

Tornoe in relevant art of electron source discloses (Fig. 1 column 1 lines 60-67, column 2 lines 17-40,claim 1) a cathode assembly 10 having an inner structure 30 and

cylindrical external surface covered with electron emissive layer 32, openings 38 separated by non-emitting masking bars 35 disposed longitudinally parallel to the axis so that they form cylindrical cage. Tornoe discloses openings being circumferentially around the cylindrical shell (cylindrical cage) can provide a desired pattern of electron emission.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the openings of Avnery circumferentially around the shell as suggested by Tonoe for providing a desired pattern of electron emission. It is further noted that this design with openings circumferentially around the cylindrical surface of the shell enhances electron emission.

Regarding claim 22 Avnery in view of Tornoe disclose the configuration of the slots and spacing between the slots can be varied . The recitation of 'to compensate for electron optic aberrations within the tube and to enhance the output of energetic electrons' has not been given patentable weight because it s considered an intended used recitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

Claims 8, 11-14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al. and further in view of U.S. Patent 6,750,461 to Fink et al.

Regarding claim 8 Avnery is silent about the electron emitting surface being a segmented dispenser cathode.

Fink in same field of endeavor discloses (Fig. 4 column 1 lines 63-67, column 2 lines 22-26) an electron source having electron emitting surface a segmented dispenser cathode. Fink further teaches this configuration of patterned cathode provides electron emission localized to specific areas.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include electron emitting surface of Avnery a segmented dispenser cathode as taught by Fink for providing a patterned cathode with electron emission localized to specific areas.

Regarding claim 11 Fink discloses (column 1 lines 21-26, column 2 lines 1-7) the electron emitting surface is a cold electron emission device. Fink further discloses this configuration does not require the hot filament (for electron emission) with high voltage and provides a flat large area cathode with many sources of electrons to many windows.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to substitute hot wire filament of Avnery by cold electron emission device as taught by Fink for eliminating very high voltage and providing a flat large area of emission.

Regarding claim 12 Fink discloses (Fig. 3) foils of individual windows 302 are bonded to the shell at the perimeters of the windows.

Regarding claim 13 it would be obvious to modify the windows extending around the cylinder in a substantially 360 degrees arc for increasing the electron emission through increased area of windows.

Regarding claim 14 Avnery and Fink disclose the windows extending around the cylinder covering less than 360 degrees.

Regarding claim 20 Fink discloses (column 2 lines 39-43) grid electrodes can be mounted internally with the electron source for controlling electron emission.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al. and further in view of U.S. Patent 7,026,749 to Rho et al.

Regarding claim 9 Avnery does not explicitly disclose electron-emitting surface an oxide cathode.

Rho in pertinent art discloses (column 3 lines 3-15, column 4 lines 23-35) use of oxide cathode for electron emission. Rho further teaches the oxide cathodes provide a more efficient cathode having improved compactness and surface evenness.

Therefore it would have been obvious to one of ordinary skill in the art a the time of invention to use oxide cathode for electron emission surface of Avnery as disclosed by Rho for providing a more efficient cathode having improved compactness and surface evenness.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al. and further in view of U.S. Patent 5,682,412 to Skillicorn et al.

Regarding claim 17 Avnery discloses (Fig. 2 column 6 lines 56-60) inside of the electron generator is evacuated by pump and then the tube 38 is sealed. Avnery does not explicitly disclose the generator is baked after pumping and then pinched off.

Skillicorn in same field of endeavor discloses (column 5 line 62 thru column 6 line 11) the vacuum envelope assembly is evacuated by means of a pump (negative pressure source attached to the tube), then baked to outgas all items from the interior and then the assembly is sealed by pinching off the sealing tube. Skillicorn discloses as is also noted by the applicant that this is a conventional method of producing vacuum envelope assembly.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include pumping, baking and then pinching off the seal tube of the electron source assembly of Avnery as taught by Skillicorn for providing the vacuum envelope assembly for the electron generator.

Claim 18 essentially recites the same limitation as of claim 17 and hence is rejected for the same reason.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,407,492 to Avnery et al. and further in view of U.S. Patent 6,661,876 to Turner et al.

Regarding claim 19 Avnery is silent about the electron generator including a getter within the vacuum.

Turner discloses (Fig. 1 column 5 lines 46-50) a getter 26 is disposed in the vacuum tube 14 to remove residual gases in the tube after vacuum sealing.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a getter inside the electron generator of Avnery as taught by Turner et al. to remove residual gases in the tube after vacuum sealing.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sikha Roy

Sikha Roy
Patent Examiner
Art Unit 2879